

MA 38500 Introduction to Logic

Spring Semester 2024

updated January 8th 2024

**As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do.
Accountable together - we are Purdue.**

Course Information

Course Number	MA 38500
Course Title	Introduction to Logic
Course Section	001
CRN	17536
Course Credit	3 credit hours
Prerequisites	Any of Undergraduate level MA 17200, MA 17400, MA 18200, MA 26100, MA 26300, MA 27100, MA 27101 with a Minimum Grade of C-
Recommended	At least one course that involves working with mathematical proofs, such as MA 30100, MA 34100, MA 35301, MA 42500, MA 45300, MA 46000 (ask instructor if unsure)
Lecture Times	Monday, Wednesday, Friday 12:30pm
Meeting Location	CL50 125
Instructional Modality	Face-to-Face
Office Hours	TBC; provisionally Monday 2-3pm, Wednesday 4:30-5:30pm, Friday 3-4pm*
Office Hours' Location	MATH 731

Note on the purpose of office hours: class time will be used to cover new material, with the exception of review classes before exams. If you have questions about class material, assignments, grading or exams, then you should drop in during any of the office hour times in order to ask.

***Please note: It is your responsibility to check your schedule and inform the instructor by email within the first week of the semester if your schedule is not compatible with these office hour times** - you should put yourself in a position to drop in to at least one office hour each week.

Instructor

Name	Prof. Margaret E. M. Thomas
Email Address	memthomas at purdue.edu (you must use your official Purdue email; emails MUST include MA38500 in the subject line)
Office	MATH 638 (but please see above for location of office hours)

Course Description

Propositional calculus and predicate calculus with applications to mathematical proofs, valid arguments, switching theory, and formal languages.

Course Webpages

Official Course Page:

<https://www.math.purdue.edu/academic/courses/semester/202420/ma38500/index.html>

The main website for the course will be in [Brightspace](#). **You will also be expected to check Brightspace, in particular the announcements, regularly.** Course information, materials and announcements will be posted there, including class handouts, lists of assignment problems with

accompanying instructions (see **Assessment Methods** below), information about exams, study tips, links to external resources, and announcements about the course.

Some information may also be found on the instructor's course website as follows (in particular, in the event that Brightspace is not accessible, the syllabus will be available at the following page):

<https://www.math.purdue.edu/~thoma922/teaching/ma38500/ma38500ss24.html>

Textbook

Jean E. Rubin, Mathematical Logic: Applications and Theory

Access to the textbook is required (see **Assessment Methods** below). The course will focus on Chapters 1 - 3, 5 - 10, 12, and may also cover a selection of topics from Chapters 4, 11, 14 - 16.

A reprinted version of the book is available at a reduced cost from the [University Bookstore](#). This is the expected source to obtain the book if you wish to have your own copy.

The original version of the book (published by Saunders) is out of print, but new and second-hand copies are still available from some other retailers or previous students.

A copy of the book is also available on reserve in the Department of Mathematics Library - you must ask for it explicitly from behind the desk and present your PUID.

Technology

- [Brightspace](#) - for course resources and announcements, including lecture handouts, details/instructions for the assignments, and exam information; **you are expected to check announcements on Brightspace regularly.**
- [Gradescope](#) (course link within Brightspace) - for submission of assignments. (See Brightspace for instructions on using [Gradescope](#), as well as **Assessment Methods** → [Assignments](#) → **Submitting to Gradescope** below.)
- [Zoom](#) (meeting links, if they are ever needed, will appear within Brightspace) - not to be used as a rule, but available in case of unexpected developments, e.g. if it happens that a class has to pivot online, then the expectation is that this would take place on Zoom.

Use of AI

You are **not allowed** to use any kind of AI tools in connection with this course. There are two main reasons for this. First, if you provide AI tools with information about this course and its materials, for example in order to ask questions about the course material, then this is arguably in breach of copyright law and thus strictly prohibited. Note that some of the central course content was developed specifically for this course and can be found only within the materials of this course, and in particular it is not common knowledge. (See also **Copyright** below.) Second, the central objective of this course is to acquire an understanding of and appreciation for the underlying mechanics of the mathematical reasoning process. Therefore, it is essential that you engage actively in various ways with the process itself, and not seek to circumvent this, say with the use of shortcuts such as AI tools (use of which is moreover likely to be inaccurate and misleading). In other words, use of AI tools is likely greatly to undermine your learning in this course.

Assessment Methods

Midterm Examinations **Two** (2) written closed-book tests **in class** of 45 minutes duration each.

Final Examination **One** (1) cumulative written closed-book final examination of 2 hours duration (date/time TBA during Finals week).

Assignments

Twelve (12) written assignments, approximately one per week (see **Schedule** below), consisting of problems from the textbook (see **Textbook** above).

The assigned problems will be posted each week to Brightspace. You **MUST** submit your work for each assignment before the deadline listed in the **Schedule** below (unless you have an extension, in which case see “**Extensions**” below). Answers should be submitted to [Gradescope](#) (see “**Submitting to Gradescope**” below for instructions on how to submit your work.)

Please note: do not just look in [Gradescope](#) to find the list of problems set for each assignment, as [Gradescope](#) does not display any additional/altered instructions, hints, or any problems that have been set that are not from the textbook. See Brightspace for this information.

You are allowed (indeed, you are encouraged) to work together with other students from the class on the assignments. If necessary, you may also use resources other than the textbook/class notes, although for preference you are encouraged to come to office hours to ask for help with assignments (see also **Use of AI** above). In any event, you **MUST write up your own solutions in your own words**, and write next to each question both the **names of any other students** with whom you collaborated on that question, as well as **clear references to any resources** (other than textbook/class notes) that you used to help you answer that question (including any online materials). **Presenting work that is not your own as though it were your own is cheating, and could result in sanctions and referral to the OSRR** (see also **Academic Integrity** below).

Submitting to Gradescope: You need to **finish (not start) submitting by the deadline**, so please be careful to start the submission process through [Gradescope](#) early enough to finish in time.

Basic instructions for using [Gradescope](#) and the [Gradescope Mobile App](#) (including preparing your work in a suitable manner for submission) can be found on Brightspace. **Please note:**

- You can submit your work using the [Gradescope Mobile App](#) or the [Gradescope](#) website.
- If you handwrite your solutions on paper, then you should scan them as a **.pdf file** for uploading, e.g. by using the [Gradescope Mobile App](#). If you write your solutions in electronic form (typed or handwritten), then please save them as a **.pdf file** for uploading.
- Please make every effort to ensure that your scans are **readable**; in particular, they should be good quality scanned documents, and not photos of your notebook taken from a strange angle!
- You can find the [Gradescope](#) link for this course in Brightspace. Use this to connect to [Gradescope](#) for the first time if you have not used [Gradescope](#) before. (If you have, then you can log in directly to [Gradescope](#), though you might need to wait until the roster is set up before you see the course available to you in [Gradescope](#), or else use the link in Brightspace.)
- When you submit your work, you are in theory given the choice of submitting a .pdf file or picture files. **Do not submit picture files**, because [Gradescope](#)'s functionalities for grading picture files are more limited, and certain mistakes with picture file submissions cannot be fixed. **Please submit a .pdf file, or your work might not be graded and you would score 0.**
- While submitting your work, you are asked to “**assign pages**” to all your solutions so that they can be located correctly. **You should do this. You might score 0 if you do not do this, as the grader might not be able to find your solution to a question.** If you forget to do this or are in a hurry to submit, then please note that **you may still assign pages after the deadline.** Please review your submission after uploading, and assign pages at that point if still needed.

Late submissions: You may see a “late deadline” listed in [Gradescope](#) as well as the regular deadline. This is only there in case of emergencies, such as technical issues, and you should still adhere to the deadlines in the **Schedule** below. If you submit your work after the regular deadline and before the “late deadline”, it will still be uploaded to [Gradescope](#), but it will be stamped as

being late, and it will be only be graded at the discretion of the instructor and may incur a late penalty. Therefore, if you end up uploading your work to [Gradescope](#) after the regular deadline but before the “late deadline”, then you **MUST still email the instructor as soon as possible to give an explanation.**

If you are too late to submit through [Gradescope](#) at all (as opposed to your submission being accepted by [Gradescope](#) but marked as “late”, for which see the previous paragraph), then email the instructor your **entire .pdf submission** (NOT picture files) with an explanation; it will be at the instructor’s discretion whether or not to accept your submission or to impose a late penalty.

Extensions: Contact the instructor **by email** as early as possible if you would like to request an extension for an assignment. If the extension is granted, then the deadline in [Gradescope](#) will be adjusted for you. (See also policies regarding **Attendance** below.)

Make-Up Exams: You must contact the instructor **by email** as early as possible (at least a week in advance, and preferably longer, except in case of an emergency) if you would like to request to sit an examination at an alternative time due to a clash or an excused absence (see **Attendance** below for more details). It will be at the instructor’s discretion how to accommodate such a request.

Grading: For most assignments, the majority of the problems will be graded for completion, with a subset of the problems given more comprehensive feedback, so it is very important that you submit an honest attempt at all of the problems which have been set. It is also possible that the focus of the grading could differ between assignments and exams. If you wish to obtain more detailed feedback on your work, then please come to office hours to ask.

Schedule

Planned schedule for assignment due dates and midterm tests:

Assessment	Date	Deadline/Time
Assignment 1	Friday January 12 2024	6pm EST
<i>MLK DAY Monday January 15 2024 (no class)</i>		
Assignment 2	Friday January 19 2024	6pm EST
Assignment 3	Friday January 26 2024	6pm EST
Assignment 4	Friday February 2 2024	6pm EST
Assignment 5	Friday February 9 2024	6pm EST
Midterm Test 1	Friday February 16 2024	12:30pm EST in class
Assignment 6	Friday February 23 2024	6pm EST
Assignment 7	Friday March 1 2024	6pm EST
Assignment 8	Friday March 8 2024	6pm EST
<i>SPRING BREAK Monday March 11 2024 - Sunday March 17 2024 (no class)</i>		
Assignment 9	Friday March 22 2024	6pm EDT
Midterm Test 2	Friday March 29 2024	12:30pm EDT in class
Assignment 10	Friday April 5 2024	6pm EDT
Assignment 11	Friday April 12 2024	6pm EDT
<i>Final date to withdraw from a course with a W or WF</i>	<i>Friday April 12 2024</i>	
Assignment 12	Friday April 19 2024	6pm EDT
Final Examination TBA (during Final Exams week, the week starting Monday April 29 2024)		

Course Evaluation

Final grades will be calculated according to the following weighting of the above assessments:

Assignments	25%	(where only the 10 highest scores will be counted)
Midterm Tests	40%	(i.e. 20% for each midterm)
Final Exam	35%	

Students who get at least 97% of the total points in this course are guaranteed an A+, 93% guarantees an A, 90% an A-, 87% a B+, 83% a B, 80% a B-, 77% a C+, 73% a C, 70% a C-, 67% a D+, 63% a D, and 60% a D-; for each of these grades, it's possible that at the end of the semester a somewhat lower percentage will be enough to get that grade.

The instructor reserves the right to adjust this grading scheme at the end of the course; this adjustment will be applied uniformly and in a manner which only increases individual grades.

Attendance

Students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an examination. Only the instructor can excuse a student from a course requirement or responsibility.

Under academic regulations, excused absences may be granted for cases of grief/bereavement, military service, jury duty, parenting leave, or emergent or urgent care medical care. In such cases, you or your representative should contact or go to the [Office of the Dean of Students](#) website to complete appropriate forms for instructor notification. For details, see the [Academic Regulations & Student Conduct section](#) of the University Catalog website.

In other situations, when conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible **in writing, by email**.

For **unanticipated or emergency absences** when advance notification to the instructor is not possible, the student should contact the instructor as soon as possible thereafter **by email**.

Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu, or by calling 765-494-8778, or by contacting the [Office of the Dean of Students](#). While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty" (Section B.2.a of the [Student Regulations concerning Conduct](#)).

Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of ghostwritten papers, the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest."

Incidents of academic misconduct in this course will be addressed by the course instructor and referred to the [Office of Student Rights and Responsibilities \(OSRR\)](#) for review at the university level. Any violation of course policies as it relates to academic integrity will result minimally in a failing or zero grade for that particular assignment or test, and at the instructor's discretion may

result in a failing grade for the course. In addition, all incidents of academic misconduct will be forwarded to OSRR, where university penalties, including removal from the university, may be considered.

Commercial Note Taking in Classes

Notes taken in class are generally considered to be “derivative works” of the instructor’s presentations and materials, and they are thus subject to the instructor’s copyright in such presentations and materials. **No individual is permitted to sell or otherwise barter notes, either to other students or to any commercial concern, without the express written permission of the course instructor.** To obtain permission to sell or barter notes, the individual wishing to sell or barter the notes must be registered in the course or must be an approved visitor to the class. Course instructors may choose to grant or not grant such permission at their own discretion, and may require a review of the notes prior to their being sold or bartered. If they do grant such permission, they may revoke it at any time, if they so choose.

See the [Regulations on Student Conduct: Miscellaneous Conduct Regulations \(point 10\)](#).

Copyright

See the University Policies and Statements section of Brightspace for guidance on Use of Copyrighted Materials. Effective learning environments provide opportunities for students to reflect, explore new ideas, post opinions openly, and have the freedom to change those opinions over time. Students and instructors are the authors of the works they create in the learning environment. As authors, they own the copyright in their works subject only to the university’s right to use those works for educational purposes. Students may not copy, reproduce, or post to any other outlet (e.g., YouTube, Facebook, or other open media sources or websites, **including AI tools**) any work in which they are not the sole author, or the joint author having obtained the permission of the other author(s). In particular, disseminating notes, assignments, solutions, textbook extracts, exams or other course materials (**including to AI tools**) is strictly prohibited.

Nondiscrimination

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. Purdue’s nondiscrimination policy: https://www.purdue.edu/purdue/ea_eou_statement.php

Academic Accommodation of Students with Disabilities

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let the instructor know so that options can be discussed. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone at 765-494-1247.

If you have been certified by the Disability Resource Center (DRC) as eligible for accommodations, you should contact your instructor to discuss your accommodations as soon as possible. Here are instructions for sending your Course Accessibility Letter to your instructor: <https://www.purdue.edu/drc/students/course-accessibility-letter.php>

Such accommodations can only be made if the instructor is informed about them in a timely way. In particular, **requests to take any exam at Purdue Testing Services should follow the**

[requirements of PTS](#) (e.g. for midterm exams, requests should be made **four days** in advance and, for the final exam, requests should be made by PTS' deadline, which will be announced at the PTS link just given above). You must make the booking using the RegisterBlast link in Brightspace.

Mental Health

If you find yourself beginning to feel some stress, anxiety, and/or feeling slightly overwhelmed, try [WellTrack](#). Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8am- 5pm.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc. sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to CAPS office on the second floor of the [Purdue University Student Health Center \(PUSH\)](#) during business hours. The [CAPS website](#) also offers resources specific to situations such as COVID-19.

Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday.

Major Campus Emergency

In the event of a major campus emergency, course requirements, deadlines, and grading are subject to change that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted on course websites or sent by email. You are expected to read your @purdue.edu email on a frequent basis.

A link to Purdue's Information on [Emergency Preparation and Planning](#) is located in Brightspace under "University Policies and Statements." This website covers topics such as Severe Weather Guidance, Emergency Plans, and a place to sign up for the Emergency Warning Notification System. You are encouraged to download and review the [Emergency Preparedness for Classrooms document](#), which is also included at the end of this syllabus.

The first day of class, the instructor will review the Emergency Preparedness plan for the specific classroom, following Purdue's required [Emergency Preparedness Briefing](#). Please make note of items such as:

- The location to where we will proceed after evacuating the building if we hear a fire alarm.
- The location of our Shelter in Place in the event of a tornado warning.
- The location of our Shelter in Place in the event of an active threat such as a shooting.

Current information for the building for this class, which is CL50, is also given below:

Fire Alarm: Exit building and assemble on Memorial Mall.

Shelter in Place Location:

Tornado: Lowest level away from exterior doors and windows.

Major hazardous materials release: Shelter in nearest building or classroom, shutting any open doors and windows.

Active Shooter etc.: If one cannot get away, shelter in a room that is securable preferably without windows.

If you are directed to shelter in place, but you are unaware of the specific reason, proceed to the lowest level of the building but continue to seek additional information by all possible means to determine the type of incident.



EMERGENCY PREPAREDNESS for Classrooms

EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **Indoor Fire Alarms** mean to stop class or research and immediately evacuate the building.
 - Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (Shelter in Place) in a safe location within the closest building.
 - “Shelter in place” means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, an active threat such as a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

**In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html*

EMERGENCY RESPONSE PROCEDURES:

- Review the **Emergency Procedures Guidelines**
https://www.purdue.edu/emergency_preparedness/flipchart/index.html
- Review the **Building Emergency Plan** (available on the Emergency Preparedness website or from the building deputy) for:
 - evacuation routes, exit points, and emergency assembly area
 - when and how to evacuate the building.
 - shelter in place procedures and locations
 - additional building specific procedures and requirements.

EMERGENCY PREPAREDNESS AWARENESS VIDEO

- **"Run. Hide. Fight.®"** is a 6-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See:
https://www.youtube.com/watch?v=5mzl_5aj4Vs

MORE INFORMATION

Reference the Emergency Preparedness web site for additional information:
http://www.purdue.edu/ehps/emergency_preparedness